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ABSTRACT

A special sampling procedure for collecting health statistics and related information from a representative sample of migrant farmworkers was developed for the New York Migrant Health Interview Survey conducted in Wayne County during the summer of 1982. A three-stage, stratified random sampling technique was used. The primary sampling units were migrant camps and other migrant housing units; the ultimate sampling units were individual migrants. The detailed sampling procedure used consisted of seven steps: compiling a comprehensive list of primary sampling units; stratifying migrant camps and other migrant housing units; determining preliminary sample size and distribution; determining sampled camps and housing units; selecting sample households; determining migrant population on a given day; and calculating weighting factors. A weighting procedure was used to adjust oversampling or undersampling of different segments of the population. Results indicated that the sample was not only representative with respect to the size of the migrant camps, but also representative with respect to distinct household characteristics associated with different camp size. (Author/NQA)

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A Research Note: A New Sampling Procedure for Surveying Health Conditions of Migrant Farm Workers

by

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Abstract

This paper provides a special sampling design for collecting health statistics and related information from a representative sample of a highly transitory population--migrant farmworkers. A weighting procedure is used to adjust oversampling or undersampling of different segments of the population. The results indicate that our sample is not only representative with respect to the size of the migrant camps but also representative with respect to distinct household characteristics associated with different camp size.

Introduction

Since migrant farm workers are highly transitory, collecting health statistics and related information from a representative sample of this population is a complicated task. Many health researchers have noted the difficulty of obtaining data on migrant farm workers through the National Health Interview Survey because of its sample design and the need for interviewees to live in established households.[1,2] These researchers suggest that in-depth local surveys are the appropriate approach to collecting health data on seasonal migrant populations. This paper reports a special sampling procedure through which health data can be obtained from a representative sample of migrant farm workers. The sampling procedure was developed for the New York Migrant Health Interview Survey conducted in Wayne County during the summer of 1982. Since the largest concentration of migratory agricultural workers in New York State is in Wayne County, it is an ideal research site for surveying migrant health conditions.

Methods

The sampled population for this study is defined as migrant farm workers in Wayne County. A three-stage, stratified ramdon sampling technique is used. The primary sampling units are migrant camps and other migrant housing units; the ultimate sampling units are individual migrants. The detailed sampling procedure used in the present study consisted of seven steps, which are illustrated in Table 1.

Step 1: Compilation of a comprehensive list of primary sampling units

The first step was to compile a comprehensive list of migrant housing units in Wayne County. Addresses for all migrant camps having more than five living units were available from the New York State Department of Health since State law requires registration of such camps. Addresses of other migrant housing units in the county were obtained from county extension agents, migrant children census enumerators, and other workers in local agencies who are familiar with the migrant population. Within reasonable limits of confidence, the compiled list could be expected to include all migrant housing units in the county.

Step 2: Stratification of migrant camps and other migrant housing units

All migrant camps and other migrant housing units (a total of 161 in Wayne County in 1982) were first stratified according to the size of maximum capacity (column 1, Table 1). The total number of migrants that could be accommodated in each size category is shown in column 2.

It is a known fact that most migrant families tend to live in small migrant camps or in individual housing units, whereas large migrant camps usually accommodate migrants who come to work alone (most of whom are immigrants or unmarried young migrants). Therefore, stratification of migrant living units by size of maximum capacity controls the household characteristics of different types of migrants.

Step 3: Determination of preliminary sample size and distribution

Since the research budget was set up for about 250 interviews, the preliminary sample size was determined as 10 percent of the maximum number of migrants in each size category. The distribution of the expected number of migrants to be sampled is presented in column 3.

Step 4: Determination of sampled camps and housing units

Since drawing a 10 percent random sample from all camps and housing units in each size category was not economically feasible, a three-stage sampling

procedure was followed. In the first stage, a partial sample of migrant camps and housing units was randomly selected from each size category. The selection was based on two assumptions: first, that the average size was the midpoint of each size category, and second, that at least 50 percent of the units in each size group were currently occupied. For example, we expected to select 52 migrants from size category 11 to 15 (column 3, line 3). If the average size of the category is 13 and the rate of occupancy is 50 percent, we should be able to select 52 migrants from eight camps in this category (52/13 X 2 = 8). The number of camps and housing units determined in this manner for each size category in the sample is shown in column 4.

Step 5: Selection of sample households

In the second stage of the sampling procedure, up to 50 percent of housing units were randomly selected from each of the sampled camps and other housing units (as designated in column 4). If the occupancy rate was less than 50 percent, all occupied units in the sampled camps and other housing units were included in the survey. Since the migrant farm workers living in these selected units were the ultimate sampling units, the household head or an adult working member of the randomly selected household was the interview subject. For a single-person household, that person was interviewed and the final selection was not necessary. The distribution of actually interviewed migrants, as presented in column 5, is not necessarily identical with that of expected number of migrants shown in column 3 because each of the migrant camps had a different occupancy rate.

During this survey, seven Cornell undergraduate students were hired as interviewers, and one graduate student as project coordinator. All the interviewers had some survey experience through course work in Field Studies or in research methods. They were also trained in special sessions designed for the migrant project. The project coordinator assigned sampled camps or housing units to interviewers and supervised their daily interview activities. Before

the actual interviewing began, the coordinator sent letters to local growers, requesting permission for the interviewers to enter farms and to interview the migrants.

Since Cornell Cooperative Extension has operated active migrant education programs in Wayne County for more than 10 years, it enjoys a positive relationship with people and organizations in the area. This research, with the assistance of Cornell Cooperative Extension, received the full support of local growers and migrant farm workers. As a result, the rate of interview refusals was very low (less than seven percent of the total sample) and did not vary systematically from camp to camp.

Step 6: Determination of migrant population on a given day

Since October is the peak month for arrival of seasonal migrant workers, special efforts were made on October 21, 1982 to find out from owners of migrant camps and other housing units how many migrants were actually living in the units; these figures are shown in column 6. The total, 1,939 migrants, represented the total adult migrant population in Wayne County on that day. Data also showed that the actual number of migrants living in units in the smallest size category (1 to 5) was greater than the maximum capacity of these units (191 vs. 173, respectively). Since places with fewer than six housing units are not required to register with the New York State Department of Health, overcrowded conditions sometimes did exist in them.

Step 7: Calculation of weighting factors

On the assumption that sampled migrants had characteristics similar to those of migrants enumerated on October 21, the interviewed migrants can be considered a representative sample of total adult migrants in Wayne County on that day. The actual sample size was finally calculated as 11.27 percent of the total number of migrants (218/1939 X 100).

Interviews were conducted between early July and early November, starting at the small housing units and ending at the large camps. Since levels of occupancy were lower at the beginning and end of the season, we undersampled at both ends and oversampled in the middle. In order to adjust for this sampling bias, we computed a ratio between proportions of total migrants and sampled migrants in each size category (column 7). For example, in Wayne County, while 11.27 percent of the total number of adult migrants actually lived in units in the size category 6-10, we selected only 4.59 percent from that category (columns 6 and 5, line 2). Consequently, a weighting factor of 2.4569 (.1127/.0459) was applied in the statistical analysis to inflate our undersampling.

Discussion

Although migrant farm workers have attracted considerable attention as an important subgroup of the agricultural labor force, very few studies of them are based on representative samples. The purpose of this paper is to provide a special sampling design for collecting health statistics and related information from a representative sample of migrant farm workers. At the same time, it is recognized that the procedure used in the present study can be improved upon. First, the total population of 1939 adult migrants that was enumerated at one point in time (October 1982) was not cumulative. Therefore, some migrants who arrived for the cherry season and then left or others who came and went would not have been included. Second, the total enumerated adult migrant population on October 21, 1982 included migrant farm workers, but did not include other non-working family members or children. Third, although we made special efforts to include all migrant camps and other housing units in our original comprehensive list of addresses, it is not unlikely that some smaller housing units (those providing fewer than six living units) might have been missed. In future studies, the compiled list of addresses should be matched against all addresses available on the area Migrant Student Record Transfer System (MSRTS)*; unmatched addresses

on this computer system should be added to the comprehensive list. This proposed improved procedure will increase coverage of non-camp housing units, which are the ones most likely to be occupied by migrant families with children.

Nevertheless, after allowing for these limitations, we feel confident in concluding that the present study is one of the few studies (if any) that has provided researchers with a systematic approach to selecting a representative sample of migrant farm workers.

Because migrant farm workers are highly transitory, sampling this population over an entire growing season tends to be affected by different occupancy rates over time. In this study, we developed a weighting procedure to correct this bias and to yield a representative sample. However, weighting a sample may create other problems. For example, statistical analysis performed on a weighted sample is influenced by the weighted sample size. If the weighted number of cases exceeds the actual sample size, tests of significance are inflated; if it is smaller, they are deflated.[3] To avoid inflated or deflated tests of significance, it is suggested that a weighting factor be used which, when summed, will generate the same number of cases as the unweighted sample.[4] In our study, since we used ratios between proportions of total migrant population enumerated on October 21, 1982 and sampled migrants as weights for different size categories (see column 7 in Table 1), the summed total number of cases for the weighted sample (218) is the same as that of the unweighted sample (see Columns 1 and 2 in Table 2). Therefore, the weighting procedure used in this study will not have any distorting effects on the statistical analysis. Furthermore, the derived population figure for each size category (weighted sample in each category/overall sampling proportion, .1127) is the same as that of the enumerated population on October 21, 1982 (comparing Column 7 in Table 1 with Column 3 in Table 2). These results strongly suggest that our sample is not only representative with respect to the size of the migrant camps but also representative with respect to distinct household characteristics associated with different camp size.

Following this sampling procedure, the New York Migrant Health Survey collected information on migrant farm workers' socioeconomic and demographic characteristics, health habits and attitudes, health status, utilization of health services, home community characteristics and the physical environment of the current residence. Based on data from this survey, analyses of medical utilization patterns and variation in migrant health status have been completed.[5,6] Work on other migrant health-related issues is under way.

Footnotes

* The Migrant Student Record Transfer System (MSRTS) is a nationwide computerized communications network designed to transfer the education and health records of migrant students as they move from school to school.

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Table 1: Sampling Procedure, Study of Health Conditions of Migrant Farm Workers in Wayne County, N.Y. 1982

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Size Category	No. Camps*or Housing Units**	No. Migrants that could be accommodated	No. Migrants Expected to be Sampled (2) X 10%	No. Camps or Housing Units Selected for the Sample	No. Migrants Actually Sampled	Total Migrants on 10/21/82	Weighting Factor (6)/(5)
1-5	46	173	17	12	7 (.0321)	191 (.0987)	3.0751
6-10	26	223	22	6	10 (.0459)	218 (.1127)	2.4569
11-15	38	515	52	8	50 (.2294)	408 (.2110)	0.9196
16-20	20	364	36	4	38 (.1743)	267 (.1381)	0.7919
21-25	11	253	25	2	23 (.1056)	194 (.1003)	0.9506
26-30	5	142	14	1	18 (.0826)	117 (.0605)	0.7326
31-35	7	232	23	2	41 (.1880)	164 (.0848)	0.4508
36-40	3	113	11	1	22 (.1009)	91 (.0471)	0.4662
41-140	5	400	40	2	9 (.0413)	289 (.1541)	3.6189
Total	161	2,415	240	38	218(1.000)	1,939(1.000)	

* Migrant camps in New York State refer to camps having more than five living units for migrant farm workers. Such camps are required to pass the inspection by the New York State Department of Health.

** Other housing units provide five or fewer living units for migrant farm workers.

Table 2: Actual Sample, Weighted Sample and Derived Population by Size of Camps and Other Housing Units

Size Category	Actual Sample (1)	Weighted Sample (2) ((1) x Weighting factor*)	Derived population (3) ((2)/sampling proportion**)
1-5	7	21	191
6-10	10	25	218
11-15	50	46	408
16-20	38	30	267
21-25	23	22	194
26-30	18	13	117
31-35	41	18	164
36-40	22	10	91
41-140	9	33	289
Total	218	218	1,939

* Weighting factor is from Column 7, Table 1

** Sampling proportion = 218/1939 = .1127